

## **REMARKS**

Claims 1-6 are pending. Claim 1 has been amended. These amendments are supported at least by the specification in page 9, lines 19-29. Applicants respectfully submit that no new matter has been introduced.

### **Claim Rejections -- 35 U.S.C. 103**

Applicants respectfully traverse the obviousness rejections of claims 1-6 under 35 U.S.C. 103(a) as being obvious over the combination of de Winter (US 6,183,639) and/or JP 2002-292213 and/or Eckman (US 5,470,469) and/or Collins et al (US 2002/0053540).

Claim 1, as currently amended, recites a hollow fiber membrane submodule comprising a hollow fiber membrane element having an assembly of hollow fiber membranes disposed around the feed fluid distribution pipe, permeated fluid collectors for collecting permeated fluid flowing from the opening or openings of the hollow fiber membranes, and removable snaps arranged non-continuously around the outer peripheral surface of the permeated fluid collector and an end of the hollow fiber membrane element, securing the permeated fluid collector to the end of the hollow fiber membrane element in which a projection on one end of a snap is engaged in a depression provided in the end of the hollow fiber membrane element, and a projection on the other end of the snap is engaged in a depression provided in the permeated fluid collector.

None of the cited references discloses, explicitly or implicitly, that the permeated fluid collector is directly secured to the hollow fiber membrane element with snaps. Specifically, De Winter merely describes that the retaining clips are provided in the outer housing in positions abutting the first and second headers (54A, 54B), and the first and second end pieces (60A, 60B). JP 2002-292213 merely describes that the caps are secured into the casing body. Eckman teaches sealing the end caps to the tube sheet and/or the bundle with epoxy. Collins merely discloses that the header caps are attached to the casing.

De Winter discloses a filter module which has retaining clips 68 in its outer housing in positions abutting the first and second headers 54A and 54B, and the first and second end pieces 60A and 60B (Col. 3, lines 48-51; Fig. 7). Unlike the snaps recited in present claim 1, The retaining clips 68 of De Winter do not directly contact the filter module 10 (Fig. 1; Fig. 7). In

addition, the feed fluid of De Winter permeates from the hollow fiber lumen to the outer side, namely, in a direction opposite to that of the claimed invention (column 6, lines 59-65). The permeated fluid then passes through the perforated holes into a hollow tube located in the center of the module (column 7, lines 1-4). Therefore, the filter module of De Winter does not have a permeated fluid connector for collecting permeated fluid flowing from the opening or openings of the hollow fiber membranes, as recited in instant claim 1.

As the Office Action (page 2, lines 9-10) acknowledges, De Winter does not disclose that the central tube is a feed tube, as in the claimed invention. The Office Action then relies on Eckman for the teaching of a central feed tube. But Eckman, like De Winter, does not teach or suggest that a permeated fluid collector is secured to the hollow fiber membrane element with removable snaps in a non-continuous manner. In contrast, the end caps are sealed to the tube sheet and/or the bundle with epoxy (column 7, lines 29-32; column 10, lines 34-36). Therefore, Eckman does not disclose securing a permeated fluid collector to a hollow Fiber membrane element with snaps in a non-continuous manner, as recited in the amended claim 1.

JP 2002-292213 discloses a line filter that has protrusions around the outer peripheries of a casing body near both ends thereof, the casing body having a secured filter element incorporated therein; latch grooves in the inner peripheral surfaces of caps having a joint mechanism, with the caps fitted into both ends of the casing body to secure the protrusions into the latch grooves. JP 2002-292213, however, fails to disclose securing permeated fluid collectors to a hollow fiber membrane element, or securing these collectors thereto with additional separate members such as snaps. Further, JP 2002-292213 does not teach or suggest securing the caps to the casing body in a non-continuous manner.

Collins discloses a filtration cartridge wherein header caps (22 and 54) can be attached onto the casing by a snap-fit type construction (paragraphs [0031] and [0037]; Fig. 1). The cartridge of Collins differs from the claimed hollow fiber membrane submodule in at least the following aspects:

- 1) The header caps (22 and 54) of Collins do not collect permeated fluid but contain either blood before filtration (in the first inner header space 26) or hemodiafiltered blood (in the inter-stage header space 48 and the second inner header space 28). See paragraphs [0032], [0036]

and [0040]; Fig. 1. The hemodiafiltered blood corresponds to the concentrated fluid, not the permeated fluid in the claimed invention.

2) Collins does not disclose removable snaps securing the permeated fluid collector to the hollow fiber membrane element in a non-continuous manner, as recited in the amended claim 1. Instead, Collins merely teaches the header caps 22 are attached to the casing 12 (paragraph [0031]).

Unlike the filtration modules described in any of the cited references, the claimed hollow fiber membrane submodule comprises snaps arranged in a non-continuous manner around the periphery of the permeated fluid collector. These snaps serve dual functions: to directly secure the hollow fiber membrane element at a central position within the pressure vessel and to ensure a flow path through which the concentrated fluid passes. Page 13, lines 21-29 of the specification. The removable snaps are advantageous compared with securing meaning such as bonding with epoxy (as in Eckman) because they allow the replacement of hollow fiber membrane element without replacing the permeated fluid collector.

De Winter, JP 2002-292213, Eckman, and Collins, by itself individually, or even when taken in combination, fail to disclose the claimed hollow fiber membrane submodule wherein the permeated fluid collectors are directly secured to the hollow fiber membrane element with removable snaps. A *prima facie* case of obviousness has not been established. Withdrawal of the rejections of claims 1-6 under 35 U.S.C. 103(a) is respectfully requested.

### CONCLUSION

The Examiner is encouraged to contact the undersigned regarding any questions concerning this amendment. In the event that the filing of this paper is deemed not timely, applicants petition for an appropriate extension of time. The Commissioner is authorized to debit Deposit Account No. 11-0600 the petition fee and any other fees that may be required in relation to this paper.

Respectfully submitted,

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